

1 **WHAT IS CLAIMED IS:**

2 1. A process for the recovery of acrylonitrile from a reactor effluent stream
3 comprising acrylonitrile, water, and organic impurities, comprising the steps of:

4 quenching an ammoxidation reactor effluent stream that comprises acrylonitrile,
5 water, and organic impurities with an aqueous quench stream, thereby
6 producing a cooled reactor effluent stream;

7 passing the cooled reactor effluent stream through an absorption column, thereby
8 generating an absorber bottoms stream that comprises water, acrylonitrile,
9 and organic impurities; and

10 passing the absorber bottoms stream through a single recovery and stripper
11 column, generating an acrylonitrile-rich overhead stream, a lean water side
12 stream, and a recovery and stripper bottoms stream that comprises organic
13 impurities without an enrichment column.

14
15 2. The process of claim 1, where the acrylonitrile-rich overhead stream is passed
16 through a decanter to separate water from acrylonitrile.

17
18 3. The process of claim 1, where the lean water side stream is recycled for use in the
19 absorption column.

20
21 4. The process of claim 1, where the ammoxidation reactor effluent stream is
22 produced by catalytic reaction of ammonia and propylene.

23
24 5. The process of claim 1, where an acetonitrile stream is removed from said
25 recovery and stripper column.

26
27 6. The process of claim 5, wherein said acetonitrile side stream comprises 99.0% by
28 weight of the acetonitrile from said absorber bottoms stream.

29

7. The process of claim 5, wherein said acetonitrile side stream comprises 99.5% by weight of the acetonitrile from said absorber bottoms stream.

8. A system for the recovery of pure acrylonitrile from an ammoxidation reactor effluent stream comprising: (a) an ammoxidation reactor; (b) an absorption column, and (c) a single recovery and stripper column, the system not including an enrichment column.

9. The system of claim 8, where at least about 99.0% by weight of acrylonitrile is recovered from said single recovery and stripper column.

10. The system of claim 8, where at least about 99.5% by weight of acrylonitrile is recovered from said single recovery and stripper column.

11. The system of claim 8, where at least about 99.7% by weight of acrylonitrile is recovered from said single recovery and stripper column.